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The Trade Review.

A JOURNAL OF MANUFACTURES, COMMERCE, INDUSTRY, SCIENCE, ART AND INVENTION.

Vol. XIV.—No 29. CLEVELAND, JULY 16, 1881. No. 702

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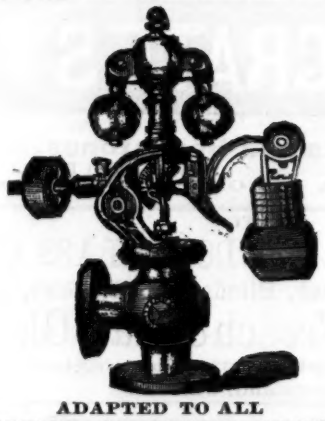

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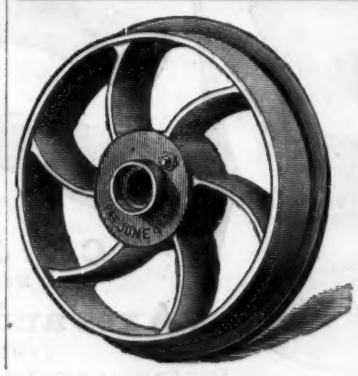

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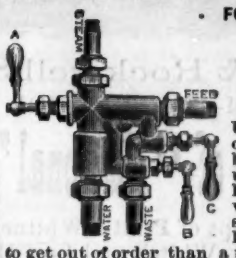

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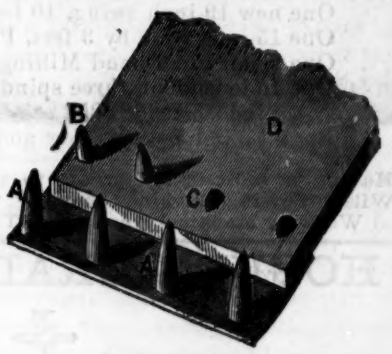

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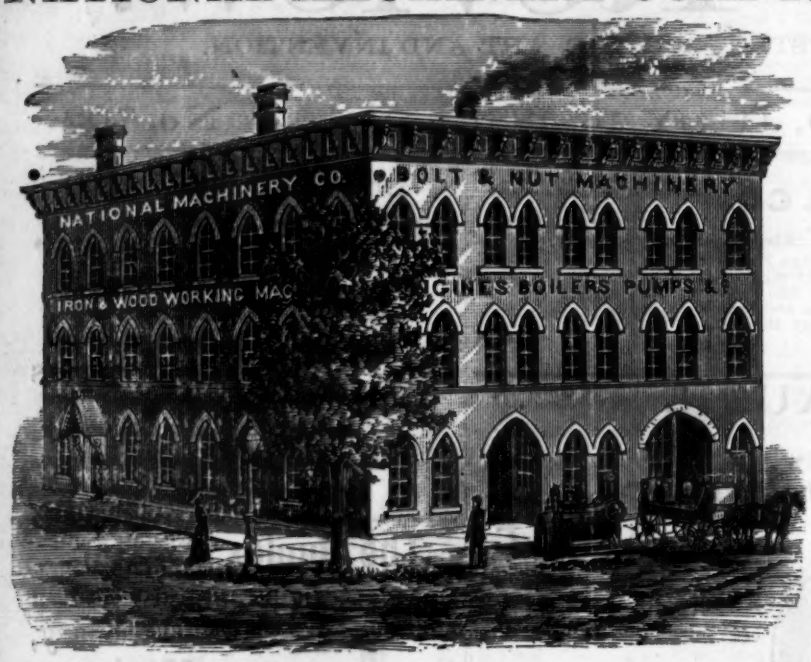

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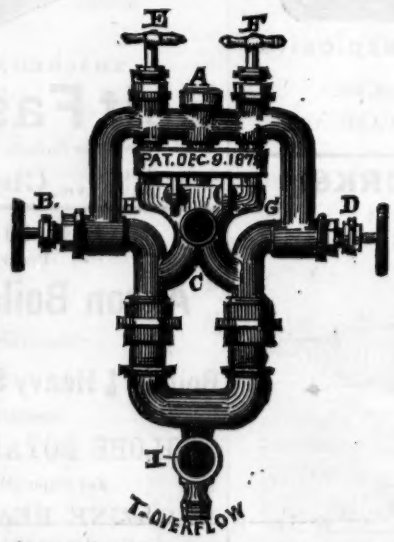
Having moved our Salesroom to the large room previously occupied by the Wilson Sewing Machine Company, we are able to carry a very fine line of Wood Working Machinery and other Tools.

HOGUE'S GRADED INJECTOR.

GENEVA, PA., Jan. 14, 1880
Gents.:

We have had one of Hogue's Graded Injectors on our boiler since last June, and are pleased to state that it has never failed to perform its duty, separating the water as represented. At first we were skeptical of its doing what we were told it would, but it compels us to say that if surpasses any machine we have ever seen for putting water into a boiler. We wish you success. Our lift is eighteen feet.

TURNER & ELLS.



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We have had one of your Graded Injectors on our large 60-horse boiler long enough to have given it a thorough trial. We declare unhesitatingly that it surpasses anything we have ever seen for putting water into a boiler. It does its work well, and we pronounce it invaluable to any one using steam.

WM. DALRYMPLE.

EXPLANATION.--A--Steam supply pipe. B--Steam supply for forcing. C--Exhaust pipe. D--Steam supply for forcing. E and F--Cut-off, water stems. G and H--Cut-off, water cocks. J--Feed pipe leading to boiler. T--Hot overflow. Water supply on other side of cut.

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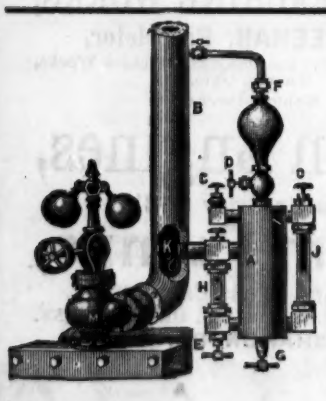

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FOURTEENTH YEAR.

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IRON MANUFACTURE OF NORTHERN OHIO AND THE CLEVELAND IRON TRADE.

Ore deliveries have been considerable the past week. There is no change in prices. We quote:

No. 1 Specular, Bessemer quality	$9 00@10 00
No. 1 Magnetic, Bessemer quality	9 50@10 00
No. 1 Hematite, Bessemer quality	6 25@ 6 50
No. 1 Specular, mill ores	9 00@ 9 25
No. 1 Magnetic, mill ores	8 75@ 9 00
No. 1 Hematite, mill ores	6 00@ 6 50
Menominee Range ores	6 00@ 9 00

Most of the Ohio furnaces continue in full blast, whilst a larger proportion than usual of the output of inferior grades is stacked. The following are the Cleveland rates of

CHARCOAL PIG IRON.

No. 1 Lake Superior Charcoal	$30 00 @ 32 00
No. 2 Lake Superior Charcoal	30 00 @ 32 00
No. 3 Lake Superior Charcoal	32 50 @ 33 50
No. 4 Lake Superior Charcoal	33 00 @ 33 50
Nos. 5 and 6 Lake Superior Charcoal	31 00 @ 33 00
Nos. 1, 2, 3, 4, 5 Salisbury	42 00 @ 45 00
Nos. 1, 2, 3, 4, 5 Tennessee cold blast	38 00 @ 40 00

BITUMINOUS AND COKE IRON.

No. 1 Foundry from Lake Superior ores	$25 00
No. 2 Foundry from Lake Superior ores	24 50
No. 1 Foundry from Lake Superior ores with cinder mixture	23 50
No. 2 Foundry from Lake Superior ores, with cinder mixture	23 00
No. 1 Foundry from native Ohio ores	22 50
No. 2 Foundry from native Ohio ores	21 00 @ 22 50
No. 1 Silvery Foundry, native Ohio ores	21 00
No. 2 Silvery Foundry, native Ohio ores	20 00
No. 1 Gray Forge from Lake Superior ores	25 00
No. 1 Gray Forge, mixture of ores	20 50 @ 22 00
White and Mottled Forge Iron	19 00

A larger amount of of pig iron has been sold the last two weeks in Cleveland than in any corresponding period this year, a fact auguring well for the future. The net cash prices we give elsewhere for manufactured iron are firm; holders will give no concessions and it is difficult at these rates to get orders supplied. An advance is very confidently looked for. There is a large stock of foreign iron awaiting shipment on receipt of favorable news. Freights have risen, thus increasing the cost of foreign deliveries. Old rails are weak at 25 to 26. Large contracts have been entered into for bridge, ship, car and iron for mines. Structural plates are firm and active. The quotations for scrap are unchanged.

NEW MOTORS.

In addition to the honor of having originated the best system of lighting for open spaces, our eminent fellow-citizen, Mr. Charles Brush, bids fair to obtain that of having invented the best system of electric storage for lighting purposes. As with electric lighting, success in this line could only be looked for by prolonged investigations and experiments, and along with many other electricians of eminence Mr. Brush has been for years devising the means to accomplish this end. All as yet known is that metal is used as the recipient, by Mr. Brush, of the electricity to be stored. The statements made by Mr. Brush warrant the expectation that we will not have to wait long before seeing his stored electricity put into street cars to operate the axles, and introduced into houses for the purpose of running sewing machines, as well as for supplying light. It is an important part of the invention that the electricity can be stored for any length of time, awaiting the occasion for use. Mr. Brush recently stated that he was able to store double as much electricity as Faure in a given space. This is of vast consequence, as contributing to the portability of the reservoirs. In the case of Faure's battery, a "million of foot pounds" was kept in a box during its seventy-two hours' journey from London to Glasgow. One of the four cells after being discharged was recharged again by its own laboratory battery, and at the end of ten days yielded "206,000 foot pounds." In this connection we may quote with advantage the remarks of the eminent electrician, Sir William Thompson, respecting storage: "The problem of converting energy into a preservable and storable form, and of laying it up in store conveniently for allowing it to be used at any time when wanted, is one of the most interesting and important in the whole range of science. It is solved on a small scale in winding up a watch, in drawing a bow, in compressing air into the receiver of an air gun, or of a Whitehead torpedo, in winding up the weights of a clock or other machines driven by weights, and in pumping up water to a height by a windmill (or otherwise, as in Sir William Armstrong's hydraulic accumulator) for the purpose of using it afterward to do work by a waterwheel or water pressure on a piston. It is solved on a large scale by the application of burning fuel to smelt zinc, to be afterwards used to give electric light or to drive an electro-magnetic engine by becoming, as it were, unsmelted in a voltaic battery. Ever since Joule, forty years ago, founded the thermodynamic theory of the voltaic battery and the electro-magnetic engine, the idea of applying the engine to work the battery backward, and thus restore the chemical energy of the materials so that they may again act voltaically, and again and again, has been familiar in science. But with all ordinary forms of voltaic battery the realization of the idea to any purpose seemed hopelessly distant. By Plante's admirable discovery of the lead and peroxide of lead voltaic battery, an advance toward the desired object was made twenty years ago; and now by M. Faure's improvement practical fruition is attained." Mr. Brush would appear to have anticipated Faure, though the latter is the first to make public proof of his system."

The storage of electricity will allow of running streams, waterfalls and the currents of rivers, being put to account in the transmission of energy. It has been estimated that under practically realizable conditions of intensity, a copper wire of half an inch diameter would suffice to take 26,250 horse-power from water wheels driven by the Falls of Niagara, and, losing only 20 per cent on the way, to yield 21,000 horse-power at a distance of 300 miles; the prime cost of the copper amounting to £60,000 or less than $15 per horse power actually yielded at the distant station.

CUTTING OF RAILWAY RATES.

THE constant cutting of both freight and passenger rates continues, with the effect of developing weakness in the New York stock market. Owing to the competition that is being developed here, the rival lines that are springing up, and the consolidations that are being promoted, a strong misgiving has been created among the holders of railway stocks abroad, and the intrinsic value of our grand trunk lines is being more severely criticised. A leading London financial writer affirms that the stocks in the companies connecting the Western States with the Atlantic seaboard are questionable investments. Notwithstanding the high dividends paid by some of these, he believes that the absolute necessity of cheap transit for Western produce will either result in a reduction of rates, or the construction of new and competing lines. It is to be borne in mind that the reduction of railway rates, constitutes a premium for water transportation, which, should the Erie canal be made free, would be greatly stimulated. One reason assigned for the present reduction in the rates of the trunk lines is that Mr. Vanderbilt seeks to check the building of rival roads and annihilate the construction companies that are contemplated in the section traversed by his properties. Railroad men believe that the present departure indicates a permanent rate of from 15 to 20 per cent in the shipment of grain from Chicago, so as to force a losing business on new corporations and construction companies by an unprofitable freight war.

AMERICAN TRADE WITH FOREIGN COUNTRIES

The time is undoubtedly arriving when the foreign trade of the United States with countries other than European, and especially those of the Far East, will assume vast dimensions. At the present time we find the shipping trade in the hands of foreign nations, affording them great facilities for traffic. We are pushing a considerable trade in China in cotton goods; we are even exporting to it flour from San Francisco, but looking at the millions of its people, and the wants we could supply, it must be admitted that we are but in the initiatory stage of trade. Returning to Foreign Consular Reports we find our Consul at Osaka, Japan, pointing out with satisfaction the increased export to this country of uncolored teas. The colored teas, made such by special processes, are put up to meet a purely factitious want on the part of the public. Uniform appearance in the leaves appeals to the eye, but the facts narrated by our Consul as to the modes of sophisticating teas should operate to the discardment of everything but the pure leaf. Now that Corea bids fair to be opened up to western trade, it is important to note its foreign imports to which this country contributes in but a slight degree. These are T-cloth, cotton sateens, Victoria lawns, cotton yarn, white metal, brocades and rifles. The materials for an export trade from Corea to this country are gold, gold dust, silver, gold sheet, bronze, iron, rice, ogon powder, ginseng, peony bark, raw silk, silk goods, hides, hoops, gum, dried sardines, isinglass, shark fins, awabi shells, gall nut, oil cake.

Our Consul at Manheim, Germany, advises, in view of the demand for American bacon, the establishment of a depot with experienced salesmen sent by the manufacturer or producer. At the same time he remarks that the increased price of meat in the United States in 1880, it being 40 per cent higher than 1879, reduces the profit to a minimum price and in some places has prevented sales. A curious fact comes out. In South Germany very little fat meat is used and will not sell well, while in North Germany the meat cannot be too fat. Regard should be paid to the manner in which the meat and hams are cut. In Manheim hams too salt will not sell, and smoking should be left to be done there. It appears from the report of Consul Gerrish, at Bordeaux, that the recent decree of the French Government prohibiting the entry of American salted pork, hams, bacon and

lard, into any port of France, a decree which created much excitement, not among importers and retail dealers alone, but among the large class who are the principal consumers, has had its effect in interfering with the establishment of a direct line of steamers, favored by a Government subsidy, from Bordeaux to New York, the return freight calculated on consisting of pork, hams, &c. The suspension of the project, owing to the absence of a return freight, is to be regretted. The importations at Bordeaux directly from the United States of pork, hams and bacon, for the year 1880, amounted to 5,606,000 pounds. A large quantity in addition was sent by way of England and Havre. Mr. Fish, Charge d' Affaires at Berne, Switzerland, predicts a great future for our trade in cereal products. We carry on a large import trade with Spain in wine, liquorice root, cork, salt, rags, lead, ores, dried fruits, olives and olive oil, but our exports are sadly impeded by the want of steam communication. The day will undoubtedly come when this will be had direct with every great commercial nation on the globe, but before that occurs legislation must give encouragement to shipbuilding. The chief imports of Spain which we could largely supply are tools, colors, cotton (raw), cotton thread, hemp, linen fabrics, Chinese silk, woolen fabrics, mixed fabrics, timber, furniture, machinery, carriages and parts of carriages, vessels, codfish, barley, rye, and maize. Roumania is a country we hear little of but it appears that during the quarter ending June 30, 1880, there were six shipments of old iron rails and scrap iron to New York and Philadelphia, amounting in all to 5,113 tons English, and valued at $133,531.

EXPORTS AND IMPORTS.

ONE billion five hundred million dollars will very nearly express the aggregate value of our exports and imports for the fiscal year ending June 30th. The figures are enormous, far exceeding any presented in previous years. At the present ratio of increase of our trade, imagination is taxed in conceiving the extent of future development. As shown by our presentation of the leading points in Consular reports, there will be a vastly increased opening for trade in foreign countries as soon as we are prepared to take advantage of the opportunities offering. For this foreign requirements have to be more closely studied, and our shipbuilding trade must be revived. A large amount of our exports find their way indirectly to foreign countries, so that we lose a very considerable portion of the profits through intermediaries, besides being thus unfavorably situated for coming into full competition with foreign rivals. The official statistics of the foreign imports and exports at all ports of the United States during the month of May, show that the imports of merchandise during that month amounted to $55,491,072, which is about $9,500,000 less than in May, 1880, while the merchandise exports were $64,107,931, which is only $1,560,000 less than last year, making a balance in our favor of $8,616,859, against $789,797 last year. The decrease in the exports was mainly the result of smaller shipments of breadstuffs and provisions. For the eleven months ending May 30th, the exports were of the value of $856,312,666, and the imports $693,347,343. The imports show a slight falling off as compared with those of the corresponding period of 1879–80; the excess of merchandise exports over imports is $255,156,125, against $156,066,171 last year.

FINANCIAL.

THE advance in the price of Western Union occasions suspicion that Jay Gould is manœuvering to run it up in order to sell out. At the time of the consolidation we pointed out that no economy in the working of the united telegraph lines that could be introduced justified the watering of the capital by tens of millions of dollars. Speculative investors are apt to follow the lead of large operators, unwarned by the evidence afforded in the past that this apparent confidence in the quoted value of a given description of stocks is but to lure the innocent lambs on whom they design to unload. Money is never wanting to engineer these projects and heavy sales commence just at the point when confidence is highest. When in London Mr. Vanderbilt sold a vast amount of New York Central stock at a price much lower than that at which it now stands, but to have sold it further on would, as he knew, induce a marked depression, and, as the London *Economist* remarks, he knew a good deal better what he was about than do the English investors who have bought it of the syndicate at the higher price.

CINCINNATI STRIKE OF IRON WORKERS.

The diversion of the iron trade from Cincinnati is the one cloud that now presents itself it the industrial horizon. It is always a sad sight to see capital lying idle, and skilled workmen idling away their time. We do not hesitate to affirm that in the whole history of strikes the strike of the iron-workers of Cincinnati is the most audacious. Success in their demands would effectually handicap the Cincinnati manufacturers, giving to Pittsburgh advantages that would result in an important diversion of orders. As it is, Pittsburgh is largely profiting by this prolonged and utterly unreasonable strike. We are unwilling to believe what in several quarters is stoutly asserted, that the Pittsburgh manufacturers originated and are maintaining this strike. Rivalry has never yet gone so far in our industrial history. The strike occurs at a time of extreme activity of trade; when the complaint of mill men and machinists is that they cannot get their orders filled with sufficient promptitude, and when demands for iron work are increasing in a rapid ratio. The strike has compelled many of the Pittsburgh manufacturers to get their orders executed east of the Alleghenies, to their own loss and that of the strikers. The Southern trade has proved a valuable one to Cincinnati, and one of the prominent results of the railway undertakings which that city has pushed with so much energy. Now a very considerable portion of this trade threatens to be withdrawn, and trade once turned aside is not easily recovered. The iron-workers of Pittsburgh should ponder these things. Reliance on numerical strength goes for nothing in the absence of foresight to discern the tendency of events. Customers of the Cincinnati manufacturers are writing from all quarters as to the annoyances they suffer from continued delay in the execution of orders, and this at a time when they are compelled to contract largely, their stock being in course of rapid depletion.

WE are certainly advancing in science when for the discovery of faults in railway tracks not ordinarily appreciable to the eye, an automatic track tester is used, which whilst traveling at the rate of twenty-five miles an hour, records the same together with the locality where occurring. Thus we will be no longer dependent on the track walker for the discovery of defects, and railroad traveling will be rendered proportionately safer.

WE are pleased to see the *Boston Commercial Bulletin* in a new and elegant typographical dress, leaving nothing to be desired in the way of pleasurable reading. All the departments taken up by the *Bulletin*, whether relating to trade, commerce, manufactures, financial matters or mechanical inventions are most ably edited. It is wide awake to all events affecting business in all parts of the world.

SOME very interesting experiments have been lately carried out in Leipsic with a cuirass made of a newly invented preparation of steel. The metal of the cuirass is only about 3-50ths of an inch thick, and is lined inside with a thin layer of wood. The cuirass itself is fourteen inches wide and ten inches high (being intended to protect only the heart and lungs), and weighs 2¼ pounds. Eleven rounds were fired at it at a distance of 175 yards from a Martini breech-loading rifle; and of eight bullets which struck the cuirass two only pierced the metal, while even these were completely flattened and remained in the wooden lining; so that a man wearing the cuirass would have been uninjured.

MANUFACTURES.

TO MACHINISTS, MANUFACTURERS AND OTHERS.

THE publishers of THE TRADE REVIEW solicit items of information concerning manufacturing and other establishments in any part of the country, and all such items will be promptly inserted in these columns, free of charge. Facts are the only things needed; and all communications should be accompanied with the name of the contributor—not for publication—but as a guarantee of good faith.

Manufacturers, machinist and engineers are particularly requested to communicate any matters of interest relating to their specialties. No one need be deterred from sending any interesting facts in his own language, as all such contributions will be properly revised before sendin to press.

OHIO.

THE Brush Electric Company's Works, occupying six acres of ground on Mason street, Cleveland, at the crossing of the Cleveland and Pittsburgh Railroad, are the largest electric works in the world. The buildings first erected, and which consisted of a main machine shop 265 by 122 feet with proportionate large boiler room, blacksmith shop, japanning oven, carbon factory, tool, carpenter and tin shops, have since had important additions. The machinery used is of the most perfected description. The engine driving it is 400 horse power. In the boiler room are three enormous boilers of Otis steel. They were built by the Variety Iron Works and the Cleveland Steam Boiler Works. The carbon department proves one of the most interesting to visitors. Here are furnaces in operation for the burning of the carbons. Provision is made for thirty-six furnaces, each of a capacity of 10,000 carbons, capable of turning out 75,000 carbons per day. The plant for the grinding, mixing, moulding, pressing, plating and packing is on a corresponding scale. Three powerful hydraulic presses are in use. Such is the pressure of orders that a new machine shop 410 by 100 feet and an iron foundry 265 by 100 feet is to be added. Some of the material is now on the ground. The buildings are to be of brick and one story in height, thus securing the highest amount of solidity and entire freedom from vibration. With the completion of the buildings they will be capable of affording accommodation for 1,500 men, and of turning out from $8,000,000 ta $10,000,000 worth of work per annum. On a separate piece of land, facing the works, a laboratory has been erected in which Mr. Brush will pursue his investigations. Mr. George W. Stockly is the business manager of the Company and Mr. N. S. Possons the Superintendent.

ROBERT C. AYER, of Chicago, president of the corporation of Brown, Bonnell & Co., of Youngstown, is in that city making preliminary arrangements for building the largest plate and sheet mill in the world. It is the intention to have the new mill in operation by January 1, 1882.

THE Ohio Grindstone Company, of Cleveland, are now operating thirteen large quarries of the celebrated Ohio sandstone with a force of about 700 men. The company have recently taken orders for upwards of 2,000 tons of grindstones, and the entire production of the company is already sold for many months ahead.

THE Boyer Elevator Company, Cleveland, have just finished a large hydraulic elevator with a capacity of twenty-two hundred pounds, for A. Teachout & Co. The company claim for it a superiority over all other elevators now in use, for simplicity, durability and economy. They are now constructing elevators for several large firms in Buffalo.

THE Lake Erie & Western shops, at Lima, have lately turned out several excursion cars.

THE new shops of Smith, Vaile & Co., Dayton, have just started up, giving employment to 150 hands.

THE Globe Iron Works of Cleveland are running their works night and day with a force of about 175 hands.

THE Iron Clad Paint Company, Cleveland, have just received an order from Auckland, New Zealand, for a car load of their special make of paint.

M. DEAL & Co., Bucyrus, writes: "California smutter trade at home and abroad good. Nineteen machines sent to London, England, in sixty days."

A REVISED estimate of the losses by fire at Marqua's & Sons carriage factory, Cincinnati, will make the aggregate reach $1,000,000. A part of the Resor foundry was consumed.

J. RANDALL is going to run a hub and spoke works at Shelby. C. W. Smith, of Norwalk, will, in all probability, locate his novelty works there this summer.—*Cleveland Herald.*

THE Toledo Mill Pick and Stone Tool Manufacturing Company, Toledo, will be henceforth conducted by Heartly & Dempsey, Mr. T. Dempsey having purchased an interest in the business.

THE American Plating Company, Cleveland, have recently introduced into their business fine light japanning and Berlin bronzing; the latter, they claim, LOT being done by any other house west of New York city.

THE Burgess Steel and Iron Works, at Portsmouth, have started with non-union men, and the Cincinnati Mill, in Fulton, East End, have engaged union men who will withdraw from the union rather than see work go elsewhere.

THE Cleveland Hardware Company are about to remove to the large building being vacated by the Brush Electric Light Company, near Euclid avenue station, as their present facilities are inadequate to the demands of their trade.

THE Corns Iron Company, Youngstown, are running their works full time, with trade very satisfac tory. At present no new improvements are being added. The furnace for the manufacture of speigeleisen, which has been in process of construction near the Eagle furnace has been started.

THE old Eberhard Manufacturing Works, Akron, the proprietors of which are Messrs. W. and J. G. Eberhard, have been running full time for three months, with a full flow of orders. Mr. W. Eberhard is a practical mechanic and personally oversees all work. In addition to general jobbing and repairing, the building of steam engines is carried on. The firm are preparing to manufacture hangers and coupling for shafting. In the way of machines, one of its specialties is oatmeal cutters. In the foundry connected with the works all kinds of iron and brass castings are turned out.

ONE of the most successful manufactures of agricultural machines is that of Messrs. Hooven, Owens, Rentschler & Co., Hamilton. The Illinois Tradesman and Manufacturer, Peoria, says of it: This company's works cover some four acres of ground and employs upwards of one thousand skillful mechanics, draughtsmen and workmen in order to supply the wants of the nation's trade, for it must be remembered that this great establishment's business extends to all States and Territories west of the Empire State, and as a consequence it is one of the busiest industries in the whole country.

ONE of the most successful makers of chains in Ohio is Mr. Samuel Woodhouse, successor to Ohio Chain Co., Newburgh, the excellence of his productions having been demonstrated during the nine years in which he has been in business. The crane, cable, dredge and crown proof coil chains, safety chains, of which he is the manufacturer, are in every respect reliable. On visiting his works we found a number of coal mine chains being made to order. Chains, too, were on view, or in course of formation, suited for various purposes. Mr. Woodhouse undertakes to fit with chain any wheel or machine. It is high evidence of excellence in the chain line that he obtained the first premium silver medal, awarded at the Northern Ohio Fairs of 1870, 1872 and 1873.

THE *Ironton Register* says: An effort is being made at Ironton to organize a company with a capital of $125,000 to establish works for the manufacture of railroad cars and car-wheels, and some stock has been guaranteed by eitizens, but not an amount sufficient to dispel doubts as to the success of the undertaking. There is hope, however, that some foreign capital may be introduced.

MESSRS. Warner & Swasey, manufacturers of machine tools and special machinery, having, in order to increase their manufacturing facilities, erected suitable buildings on East Prospect street, between Wilson avenue and the Cleveland & Pittsburgh Railroad, the works went into operation last Monday. The new factory is supplied with the best modern tools and appliances for the manufacture of fine machinery. They state that with their increased facilities it will be their aim to produce machinery that in design, workmanship and adaptability to its various uses will be of the highest order.

THE new blast furnace being built by Means, Kyle & Co., Hanging Rock, will be built on the improved plans The furnace will be 65 feet in height and the bosh will be 17 feet in diameter It will be supplied with three Whitwell hot blast, capable of heating the blast to 1,600 degrees, or nearly double the temperature of an ordinary iron hot blast. These will be 16 feet in diameter by 60 feet in height, and of the most modern patterns. The smoke stack will be 175 feet high and constructed of iron, lined with fire brick. There will be four batteries of two 40-foot boilers each. The engine house, 29 by 41 feet, will be surmounted entirely with an iron tank 36 inches deep, which will be constantly filled for furnace purposes. The casting house will be 56 by 90 feet.—*Amer. Manufacturer.*

THE Akron Stoneware Company have added another kiln to their works, making three in all. This addition gives them a capacity of 24,000 gallons a week. Their constantly increasing business compelled them to thus enlarge their facilities, and even now they can do no more than fill their orders. They are constantly shipping large quantities of goods to all quarters, and there is every indication that the "boom" will continue.——The Webster, Camp & Lane Machine Company, Akron, are very busy just now on orders for engines and machinery for potteries, sewer pipe manufactories and mines. They have great facilities for the production of these kinds of machinery, and are reaping the benefit of turning out none but first-class articles.—*N. Y. Amer. Pottery and Glassware Reporter.*

THE shovel works of William Chisholm & Sons, located on Case avenue, Cleveland, south of Superior street, are being pushed rapidly toward completion. All the buildings, which are six in number, are constructed of brick. The main building fronts on Case avenue; it is three stories high, and 100x45 feet in dimensions. The lower floor of that part of the works will be used as a machine shop, the second for making handles, and the third for storing purposes. The middle building, directly back of the main building, is 80x32 feet in size, two stories high and an attic, and will be used for cutting, shaping and polishing purposes. In the rear is the furnace room, one story high, 100x62 feet. The engine room is just north of the furnace room, and near it stand two brick one story buildings, which are to be used for storing and drying purposes.

DOUBTLESS important results will be witnessed now that capital has been brought to bear in Cincinnati in putting to account the important discov ery of Mr. John Holland of that city of a process for fusing and molding iridium, a metal which has hitherto been practically incapable of being formed into bars. The discovery consists in applying phosphorous when the ore is brought to white heat, and afterward eliminating the phosphorus by lime applied with great heat. The new metal has the appearance of steel, but is much harder, being next in hardness to ruby. It will not rust, and cannot be injured by acids. A bar of it has been used with gratifying success in place of the negative carbon electric light. It burns 60 hours without any loss in weight or any perceptible change in form. Iridium can not be fashioned by hammering while hot, nor can it be filed. It is moulded into convenient forms, and then sawed or ground by rapidly revolving copper disks treated with emery and water.

THE Bolton Steel Company, Canton, are running their works night and day, with a force of about 175 hands.

MT. VERNON furnace has started. The Belfont Iron Works will stop close of this week to take account of stock, and the Lawrence Iron Works on Aug. 1, for the same purpose.

NEARLY twenty cars of merchant iron is being shipped each day by Brown, Bonnell & Co., Youngstown, from their extensive establishments, and the improvements lately noted will still add largely to their production. It is expected that by August they will have their new 10-inch mill ready for operation.

MISCELLANEOUS RECEIPTS.

HOW TO TELL GOOD FROM BAD GILDING.—You may find out whether gilding is genuine or not by the fact that on the latter a weak solution of protochloride of copper produces a black precipitate, which it does not on the former. In the case of gilt paper, the simples t method consiss in slowly burning the paper in a bright flame that gives out no smoke; in the incinerated remains of good gilt paper there are traces of the gold left behind, which are quite perceptible to the naked eye, in the shape of glittering spots, whilst vile metal on paper oxidizes in burning, and leaves nothing but reddish spots behind.

COPPERING AND BRONZING ZINC.—The following recipes for coppering and bronzing zinc are said to produce excellent results: Prepare a solution of fifteen parts of blue vitriol and one of nineteen parts of cyanide of potassium, then mix both solutions together. Incorporate this liquid well with one hundred and sixty parts of pipe clay, and rub the resulting semi-fluid mass, by means of a linen rag, on the previously cleaned object. For bronzing, take fifteen parts of verdigris, nineteen of cream of tartar, and thirty parts of crystalized soda, reduce them to powder, and dissolve them in the necessary amount of water. Mix this liquid together with one hundred and sixty parts of pipe clay, and then proceed as above directed. Another process is as follows: Take fifteen grammes of blue vitrol, twenty of calcined soda, and mix them well with thirty-two cubic centimetres of glycerine and mix the paste obtained with eighty grammes of pipe-clay. It is then ready to be applied as before stated.

TO MAKE PLATES FROM WOOD SHAVINGS.—Selected plane shavings are bound into bundles and steeped in a bath of weak gelatine solution about twenty-four hours, then dried and cut into suitable lengths. Plates are cut of strong paper or thin pasteboard of the size of the objects to be produced. These are moistened with a liquid consisting of weak gelatine solution with sodium waterglass and pressed in heated metallic molds. After drying, the pressed paper objects are coated on both sides with an adhesive material made of five parts Russian gelatine and one part thick turpentine, the shavings are applied to them, and the whole is subject to pressure. Wood shavings alone would because of their unequal thickness, present uneven surfaces. The objects are now cut, if necessary dried and varnished.

HOW TO TELL GOOD BUTTER.—The State Superintendent of inspectors of butter and cheese says: When butter is properly churned both as to time and temperature it becomes firm with very little working, and is tenacious; but its most desirable state is that of waxy, when it is easily molded into any shape, and may be drawn out a considerable length without breaking. It is then styled gilt edged. It is only in this state that butter possesses that rich, nutty flavor and smell, and shows up a rich golden yellow color, which imparts so high a degree of pleasure in eating it, and which increases its value manifold. It is not always necessary when it smells fresh and sweet to taste butter in judging it. The smooth, unctuous feel in rubbing a little between the finger and thumb expresses at once its rich quality; the nutty smell and rich aroma indicate a similar taste; and the bright golden glistening cream-colored surface shows its high state of cleanliness. It may be necessary at times to use the trier, or even use it until you become an expert in testing by taste, smell, and rubbing.

MECHANICAL RECEIPTS AND ITEMS.

Boring Bar.

A cheap boring bar for sizing and turning bearings in cast iron machine framing is made by taking a plain round iron bar and clamping to it, with a lathe dog, a cutter worked out of square steel bar, one side hollow to fit the bar side, the two ends at 60° angle. The bar cuts either end, is quickly made and adjusted, is quite effective, and the cheapest yet brought to our attention.—*St. Louis Age of Steel.*

Turning Chilled Iron.

An impression prevails among some mechanics that chilled iron cannot be turned in a lathe as other metal can, but this is erroneous; with proper appliances the chilled is as easily turned as soft iron. Slow speed and wide-faced tools, like those used for turning brass, are employed with satisfactory results. All chilled rolls used in paper-making machinery and in metal rolling are turned before being ground.—*Ibid.*

Sliding of Wheels on Curves.

In a discussion at the late National Car Builders' Convention on the sliding and wearing of wheels going around a curve considerable difference of opinion was expressed. Mr. Garey said that he had come to the conclusion that it was not the outer rail that was worn by the sliding of wheels on curves, but the inner. If this is so, then the cones on wheels increase the size at the point where there should be no increase, and the less coning, therefore, they get on them the better. Messrs. Adams, Hildruf, Martin and Orton all took exception to Mr. Garey's position and held that the fact of the outer rail being most worn in almost every instance, was proof that the greater weight and the sliding occurred on it. This wear they thought was increased in proportion to the speed with which the train rounded the curve. Mr. Hildruf of opinion that in going round a curve the outer wheel slipped forward and the inner wheel slipped back.

Strength and Quality of Wrought Iron.

Wrought iron should be required to stand a tensile strength of 50,000 pounds per square inch before breaking. It should not undergo appreciable permanent elongation under a less strain than 25,000 lbs. per square inch. It should stretch 15 per cent of its original length before breaking—the specimens tested being of uniform sectional area for a length equal to ten times the least diameter. Pieces cut from the bars should be capable of being bent, cold, 90° over the edge of an anvil without sign of fracture, and should show a fibrous texture when broken. Iron that will not meet these requirements is not suitable for structures.—*Leffel's Mechan. News.*

Rolling of Axles, Rivets and Bolts.

A new and improved machine for rolling axles, rivets and bolts and other articles, has lately been invented. The metal is fed into the machine through a suitable guide, consisting of a loose flanged short tube held between two or more rollers or adjustable slides, the metal being retained between the rollers by a pair of automatic tongs, which close as the work progresses.

Wear in Wire Ropes.

Dr. Chance, in discussing this subject at a late meeting of the Engineers' Club of Philadelphia, drew the conclusion that the cause of rapid wear is often due to the use of drums, sheaves and pulleys of insufficient size, and that a great saving might be effected by increasing their diameters, especially that of the small deflection and knuckle pulleys and sheaves. The actual wear averages 0.138 cents in slopes, and 0.053 cents in shafts per ton for each 100 feet of lift.

The Sand Blast.

Among the wonderful and useful inventions of the times is the common sand blast. Suppose you desire a piece of marble ornamented; you cover the stone with a sheet of wax no thicker than a wafer; then you cut in the wax the design, leaving the marble exposed. Now pass it under the blast and the sand will cut it away. Remove the wax and you have the raised design. Taking a piece of French plate glass, cover it with fine lace and pass it under the blast, and not a thread of the lace will be injured, but the sand will cut deep into the glass wherever it is not covered by the lace. Now remove the lace and you have a delicate and beautiful figure raised upon the glass. The workmen can hold their hands under the blast without harm, even when it is rapidly cutting away the hardest glass, iron or stone, but they must protect their finger nails by steel thimbles or pieces of soft cotton.

CORRESPONDENCE.

JAMESTOWN, N. Y., July, 1881.

To the Editor of the Trade Review:

The manufacturing interests of Jamestown are still on the increase. The old are enlarging and improving while numerous new ones are being added. Among the most important are N. W. Gokey & Son, boot and shoe manufacturers, who have built a new factory 35x95, five stories in height. They have put in new and improved machinery. The edifice is nearly ready for occupancy; they employ about 100 hands.——White & Stevens have erected a new building 40x150 feet, three stories high. They are putting in machinery for the manufacture of the "Champion Grain and Seed Drill," and will commence operations shortly, starting with about 75 men. This is a new enterprise.——E. F. Carpenter & Co. have leased the building and grounds formerly occupied by the Jamestown Iron Works, and are fitting it up for the manufacture of axes and edge tools; they are putting in four trip-hammers, and will at first employ from 25 to 30 mechanics. They will be ready to start up by September 1st.——A. H. Reynolds & Co. are putting in machinery for the manufacture of stockinet goods of all kinds, and will employ about 25 hands.——Bailey & Lakin, manufacturers of upholstered goods, are soon to start in with a large force, and will be prepared to meet all orders in their line.——There is not an establishment in the city which is not busily employed in filling orders. Negotiations are being made for the starting of a shoe factory, to manufacture fine shoes only, which will commence operations in the autumn. I may here mention that for the accommodation of the travelling public Jamestown has the finest hotel in Western New York. The "Sherman House," A. M. Sherman, proprietor, is in fact unsurpassed by any in the country; all the modern improvements for the accommodation of the guests have been adopted, and the internal arrangements are complete. With all the hotels on the Lake the busy season has commenced.

Yours truly, J.W.N.

FOREST CITY BIRD AND CAGE EMPORIUM.

A visit to the Forest City Bird and Cage Store, 147 Superior Street, Cleveland, of which the well known ornithologist, Mr. S. H. Wilson, is proprietor, will well repay all lovers of birds. The stock at this time particularly is large and choice, all countries whose singing birds are sought after having sent their contributions. Mr. Wilson is undoubtedly one of the finest judges of birds in this country, and has in the course of years secured an extended organization, thus being enabled to meet satisfactorily all requirements. His judgment in the matter of selection will be found extremely serviceable. Prominent in his aviary are those delightful cage birds of Germany—canaries. They warble and trill with exquisite sweetness, and some have the famous bell note. These birds are very different from those raised elsewhere than in Germany, whose notes invariably are harsh. All the canaries sold are guaranteed as first-class singers. Among other choice specimens of the feathered race here collected are mocking birds, thrushes, black-birds, nightingales, robins, black caps, starlings, orioles, sky larks, tropical and all soft-billed birds. The prices of these birds vary with the character of the notes or song, this value being accurately adjusted, and one is struck at the moderateness of price at which valuable songsters can be secured. Mr. Wilson's knowledge of the treatment of birds is ever at the service of his customers, so that no apprehension need be entertained that they will perish for want of proper food or medicine. Suitable cages in new and neat and elegant styles are supplied. The gold fish constitute a leading attraction. Any of the leading varieties may be obtained in abundance. The beauty and constant activity of gold fish render them choice ornaments for the sitting and drawing room. A large number ot acquariums are in stock with water ornaments and plants suited to heighten the effect of the darting movements of the finny occupants.

RAILROADS AND TRAFFIC.

GENERAL John M. Corse, the President of four or five different narrow gauge roads which are soon to be consolidated under the name of the Toledo, Cincinnati and St. Louis Railroad, states that this system will be about 1,000 miles in extent, and besides the main trunk from Toledo to St. Louis, now partly built and in process of construction. It has a branch running south from Delphos, O., about 100 miles to Dayton, O., where two prongs shoot forth, one south to Cincinnati, about seventy miles, and the other southeasterly to Ironton, about 200 miles. On the latter prong a branch extends from Wellston, below Chillicothe, to Gallipolis, seventy miles. At Ironton on the Ohio river, the road connects with the Chesapeake and Ohio railroad. Between Chillicothe and Ironton there are about twenty furnaces in operation, which will be tributary to the road, and the region embraces a large coal field containing, according to an eminent geologist, the best bituminous steam coal in the world, and it also makes iron in its raw state.

NEXT week a sleeping car, running direct from Cleveland to New York over the Lake Shore and New York Central, will be attached to the Lake Shore train leaving Cleveland at 2:55 p. m. Heretofore sleeping coaches passing through Cleveland to New York have started from St. Louis, and Cleveland passengers were obliged to put up with what accommodations they could get after western tourists had had their pick.

THE Pullman car shops at Detroit have lately completed two sportsmen's cars for the Pennsylvania Railroad. They are furnished with berths for 12 persons, and each has, in addition, a kitchen refrigerator, ice chest for game, wine closet, gun closet, ammunition room and accommodations for 12 dogs; they are well ventilated and luxuriously furnished. They are appropriately named "David Crockett" and "Isaac Walton." It is said that both are engaged for the entire season.

THE contract for grading and completing the Chicago and Atlantic road from Marion, O., to a junction with the Chicago and Western Indiana near Chicago, about 260 miles, has been let to Conant & Smith, of New York. This is the road which is to be the Erie line to Chicago

FOR several weeks past the Cincinnati, Indianapolis, St. Louis and Chicago Railroad Company has been quietly buying up the property in Pittsburgh with a view of erecting the largest passenger depot west of the Allegheny mountains. Their operations were kept quiet, in order that the owners of the property might not learn of their plan and advance prices to an unreasonable figure. The location is central and accessible to all the roads entering the city, with the exception of the Little Miami and Louisville Short Line, which come into the city on the east side, and are now building a fine depot.

PRESIDENT M. M. Green, of the Columbus and Hocking Valley and its tributary roads, states that the details of the transfer of the Hocking Valley system of roads to Andrews, Burke, Hickox and the Cleveland syndicate have been satisfactorily adjusted on the basis of 180 for Hocking Valley stock, 125 for Columbus and Toledo and Ohio and West Virginia on private terms, 80 it is said. This will bring some $3,000,000 or $4,000,000 of loose capital to Columbus for investment. The three roads by the terms of the sale remain under Mr. Green's management for five years to come, and the three Boards of Directors will be consolidated into one, which will be made up of the new owners. Members of the same syndicate are now in the Bee Line and Cincinnati, Hamilton and Dayton consolidation, Judge Burke, especially, being largely interested. They are also prominent in the New York, Pennsylvania and Ohio road, Mr. Devereux, of the Bee Line and Hamilton and Dayton, being also President of the last named. The acquisition of the Hocking Valley roads makes the fourth lot of lines which, together with their feeders, have been absorbed into the combination.

THE Louisville Short Line has been sold to the Louisville and Nashville Company. The Short Line has $2,500,000 stock, of which $1,500,000 is preferred. The rate of sale is 122 3-5. This will give the purchasers a direct line into Cincinnati, and will give to Porkopolians another outlet to the South and Southwest.

ITEMS OF INTEREST.

THE number of woolen mills in the Western States is 668, of which Ohio has 208, Indiana coming next with 101.

THE Indian Government has granted 6,000 rupees to the Tea Syndicate to help in the opening of the tea trade with America.

NO LESS than 675 models and plans have been submitted to the N. Y. Humane Society for the so-called prize of $5,000 for the best stock car.

IT is said that iron or steel immersed in a solution of carbonate of potash or soda for a few minutes, will not rust for years, not even when exposed to a damp atmosphere.

THE U. S. Consul at Carrara, Italy, says there is an opening for American capital in the quarrying and shipping of Carrara marble, which is now quarried in the rudest and most barbarous manner.

THE impetus given to the manufacture of bricks by the extensive building operations of this season is without precedent From all parts of the country we hear of yards being worked to their fullest capacity.

PROF. N. H. Winchell, state geologist of Minnesota, estimates the amount of pine lumber suitable for manufacturing, still standing in that State, at 5,760,000,000 of feet. This includes the several Indian reservations.

A COMPARISON of Russian petroleum from the Caucasus with the American petroleum from the United States has shown that the illuminating power of the former is 10 per cent greater than that of oil from the States.

A NEW HAVEN (Conn.) firm sends thousands of the red American fox skins to Russia every year. These skins, which are used in the Muscovite country to line costly garments, are contributed to a considerable extent by Maine, Vermont and New Hampshire.

MELZER MOSSMAN, who has charge of the bronze department of the Ames Works at Chicopee, Mass., is now at work on the artillery group of the Lincoln monument. This has three figures and the artillery accessories, and will contain about 7,000 pounds of metal.

THE *N. Y. American Machinist* says that any body who knows the address of Frank C. Horn, a machinist, who left Cleveland for Akron last April, will oblige by sending it to that journal. The assistance of Mr. Horn will prove of great weight to a poor widow lady in gaining her rights in a legal contest.

"AMERICAN shipowners cannot rival foreign owners because of the difference in taxation, in the cost of capital and labor, in the conditions of competition, in the starting of new enterprises, in competition with those long established and in possession of the business—not because of original cost. —*John Roach.*

SINCE 1871 the grain crops of the United States have been valued at the enormous sum of $10,000,000,000, or an average of $1,000,000.000 per annum. Of this total about one-half, or $5,000,000,000, has been the value of the corn crop, while the wheat crop during the same period has aggregated a value of $3,500,000,000.

THE Statistics of Agriculture show that the tobacco produced in Ohio in 1880 amounted to 34,725,405 pounds, being a yield of 1,001 pounds per acre. Ohio is only preceded in production by Kentucky, Virginia and Pennsylvania, which yield respectively in the order named, 171,121,134, 80,099,833 and 36,957,772 pounds.

THE Swiss Government is so much exercised over the immense increase of emigration to the United States that it contemplates legislation that will tend to lessen or remove the causes of it. Several counties are almost depleted of able bodied inhabitants. A thousand of the emigrants recently gathered at Basle during one day.

THE cost of material and labor has so far advanced this year as to make a marked difference to railroads ordering new railroad stock. Locomotives have advanced from $9,000 to $11,500 on an average. Passenger coaches have increased fully one-third. They run about $4,500. Freight cars have advanced from $450 to $650. Large contracts have recently been let at the latter price.

ONE of the largest and perhaps the largest deposit of specular iron ore yet found in the southern country has recently been discovered near Acworth, Ga. The vein is a large one—five feet at the surface, and approaching the surface in the form of a wedge. It is pronounced by scientifice men to be of the highest order in quality, perfectly free from sulphur and phosphorous and very strongly mag netic.

M. E. KRITCH, practical machinist of 42 South Water Street, Cleveland, is prepared to undertake contracts for all descriptions of model work and pattern making. Metal patterns which we have had the pleasure of inspecting, exhibit first class workmanship. Indeed his reputation in this line gives him a foremost place. His services are in great requisition for making and repairing small and complicated machinery.

THE sixteen American inventions of world-wide adoption are the cotton-gin, the planing machine, the telegraph, the grass mower and reaper, the rotary printing press, steam navigation, the hot-air engine, the sewing machine, the India rubber industry, the machine manufacture of horse shoes, the sand blast for carving, the gauge lathe, the grain elevator, artificial icemaking on a large scale, the electric magnet and its practical application, the telephone.

IT appears from a recent discussion of the Societe des Ingenieurs Civil, that steel is making somewhat slow progress in France as a material for stationary boilers. M. Jourdain stated that a certain number of makers were employing steel plates for parts directly exposed to the fire, but that he did not know of any stationary boiler constructed entirely of steel. This is the more to be wondered as the steel plates turned out at Crusot and at some other French works are of an admirable quality.

IN AN article on Chicago's steel industry the Chicago *Journal of Commerce* states that from the two existing steel plants there will be for the present year a probable product of 200,000 tons of rails, and when the South Chicago works are in full running order the product will reach quite 400,000 tons of rails per annum. Reckoning in dollars and cents the product at present prices of rails and iron indicates gross figures amounting to something over $25,000.000, a growth of business of which Chicago may well be proud.

AGRICULTURAL implement manufacturing is one of the most rapid-growing and staple of all American industries. In 1850 there were only 5,361 hands employed in this manufacture; there are now 40,680, the number having nearly doubled since 1870. Ohio employs more persons in this trade than any other State, having 10,248 hands, against only 165 hands in 1860. Our exportations of agricultural implements are already large, and increase steadily to all parts of the world, notably to the British colonies and possessions.

THE services of H. J. Webb & Co., the well known ship brokers and vessel agents, 17 and 18 Board of Trade Building, 122 Water street, Cleveland, have been in active request for the chartering of vessels for the lake trade, especially for the Lake Superior iron ore trade. Charters are made by the firm both for the season and single trips. Mr. H. J. Webb, who has been in business since 1854, was one of the first brokers and vessel agents on the lakes, and his extensive connections and personal ability have secured a business which has rapidly grown with the increase of our lake marine and trade.

THE Saginaw, Mich., *Herald*, says: Mr. O. A. Gould, living near that city, has established a new industry. He has provided machinery by which he manufactures cedar strips for lining trunks, wardrobes, furniture, clothes presses, or for inside finishing for houses if needed. The machinery consists of a set of knives 6½ feet long, which commences on the outside of a cedar log and cuts it in one continuous strip in any thickness required from the thirty-second part of an inch to half an inch in thickness, and the strips of wood being delivered in a compact roll ready for use as soon as cut. The importance of this manufacture consists in that cedar wood is a complete protection against all kinds of small vermin. The design is to use this cedar for ceiling in pantries, clothes presses, store rooms, &c. The strips can be cut fifty feet long.

THE finest floors are said to be seen in Russia. For those of the highest grade tropical woods are exclusively employed. Fir and pine are never used, as in consequence of their sticky character they attract and retain dust and dirt, and thereby soon become blackened. Pitch pine, too, is liable to shrink, even after being well seasoned. The mosaic wood floors in Russia are often of extraordinary beauty. A considerable trade is done in Dantzic and Riga by exporting small blocks of oak for parquette floors. Some of our American ornamental woods might profitably be exported for floor purposes to Russia and France.

Since the resumption of specie payment, that is during the last two years and a half, between $300,000,000 and $400,000,000 of the precious metals have been added to our stock of metallic currency. The influx of immigration this year into the United States transcends anything ever witnessed before. No longer than a few days ago the Census Bureau announced that the acreage of the crop products of the United States has exactly doubled within the past decade. As the railway mileage of the United States has also doubled within the same period it would seem to be tolerably clear that we are developing freights to be carried as fast as we are developing railways to carry them.

REFERRING to the scarcity of black walnut, we lately gave the views of extensive lumber dealers who say that the supply of this wood is rapidly diminishing and indeed practically exhausted in several localities whence it has hitherto been chiefly obtained. No one appears to have mentioned Kentucky as a past, present or prospective source of supply. This omission lends importance to a statement in *The Louisville Courier Journal* to the effect that Kentucky abounds in black walnut timber of excellent quality. The counties which are said to be especially rich in this valuable wood are Jackson, Gallatin, Kenton, Boone, Bath, Anderson, Shelby and Greenup. Hitherto in Kentucky an immense number of black walnut trees have been thoughtlessly destroyed to clear land or cut up into fence rails.

A REMARKABLY interesting experiment has just been made at Calais and Dover, between which places a conversation has been kept up *viva voce* by means of a new kind of telephone, which has been patented under the name of "electrophone." Not only were the words whispered into the apparatus at Calais distinctly heard at Dover, and of course *vice versa*, but the listener at one end was perfectly able to distinguish by the mere tone of voice who was speaking at the other. The scientific specialists present were astonished at the difficulties successfully overcome in the enormous condensation produced by the metallic covering that protects the cable, and in the induction caused by the simultaneous passage of telegraphic dispatches along the other wires of the cable. Experiments with the same apparatus were then continued between Dover and London with the same results. The inventor maintains that it is just as easy to talk across the Atlantic as from one room to another.

IT is a suggestive fact that whilst nature effects varied and often magnificent hues and blendings of color, art has only been able to produce a very few. The colors elaborated by art are confined to violets, purples, etc., obtained from cochineal and murevide. Uric acid is the coloring principle which nature employs in the production of those exquisite tints we see in the plumage of birds and on the bodies of insects. It is liberally bestowed on birds and insects in gorgeous crimsons, scarlets, blues and green, as well as of yellows and other less brilliant shades. The *elytra* of the beetle presents a magnificent green which is very fast, but the brightest hues of the butterfly will fade away as the *exuria* falls off. Uric acid, which has done so much in nature, might surely make more progress in art than it has it has done hitherto. But it is not in mere color that we seek for success, it is in permanency. The fast predominates among beetles and hemipterous insects, the fugitive being found among butterflies, moths, dragon flies and some of the wasp tribe.—*Boston Com. Bulletin.*

SUBSCRIBERS and others when writing to advertisers will confer a favor on the publishers by mentioning that they saw their advertisement in the columns of the TRADE REVIEW.

MINES AND MINING.

THE total daily output of ore at Denver, Col., is estimated at 271 tons.

THE total value of the production of the Leadville mines for the first six months of this year was $6,501,813.

AN English company has been formed to work the copper mines of the island of Michipicoten, on the north shore of Lake Superior.

THE Iron Silver mines, Leadville, Col., yielded in March, April and May, 17,453 tons, of the value of $362,000, yielding a profit of $167,233.

THE Chrysolite, Colorado, has resumed shipping large quantities of ore. Late suspension of operations at the mine has been beyond doubt in furtherance of a stock deal by the management.

THE Carbon mine, Colorado, has turned out 144 tons of ore, producing 8890 ounces, or an average of 61 ounces to the ton. The ore continues good; the mill and water-power are working splendidly.

THE Idaho tunnel, Colorado, is now in the mountain 1100 feet, and the lode was cut at a depth of 425 feet from the surface. Lodes which are cut from this time forward will be at so great a depth that it will require much time and money to "prove up" by surface claimants; and, if rich, the tunnel company may work for years before owners will succeed in demonstrating their proprietary rights.

AT the new placers in New Mexico, where the San Pedro and Canyon del Agua Company are largely the owners, there are said to be 30,000 acres of immensely rich gold diggings, both placer beds and well defined lodes, bearing free milling ores. The company has been energetically at work, having laid about thirty-six miles of pipe which will convey water from the Rio Petros river; and with extensive machinery for both its placer mines as well as working its gold ores, the development of the richest mines in New Mexico is confidently expected.

THE *Silver World* says: A. C. Wheeler is authority for the statement that he and Charles Martin have discovered a huge vein of what he terms "electric rock"—probably rock carrying magnetic iron—which he claims possesses sufficient power to convey a shock, run a battery or draw steel articles to it. He claims that in going up to the North Star mine, on King Solomon mountain, near Silverton, a shovel carried by him suddenly began rapping on the rock, drawn by the electric or magnetic current—and thus led to the find, which they located. Mr. Wheeler says a specimen as large as a hen's egg ran a battery at Silverton for an hour.

THE Philadelphia *Ledger* says: A portion of six tons of silver ore from the San Miguel and Roncesvalles mines in Mexico has been received at Windmill Island, to be reduced by the smelting works of the Tatham Brothers, at that point. It was necessary to carry it north from the mines on pack horses, through a mountainous region for 300 miles, whence it was transferred to the Mexican Central Railway Company at El Paso, and came the remainder of the way by rail. This shipment is experimental, as the tax on silver bars taken out of Mexico is ten per cent, while it is nothing on the ore, and the purpose is to save the ten per cent, provided the profits will leave a margin in favor of reducing the silver in this country. This lot of six tons is estimated to be worth $50,000.

A SCHOONER has sailed from San Francisco in search of a silver mountain of great value on Fish River, Alaska. When last season in the neighborhood of Behring Straits, Captain Gallagher, who commands the expedition, took his vessel up into Fish River to get a supply of fresh water. He noticed that the natives had pieces of ore. On going some twenty miles up they ascended to what seemed the crater of an extinct volcano, and found the rock from which the natives obtained their specimens. It cut like lead or silver, and Ryan dug down for six feet and found a bed of ore apparently inexhaustible. Some specimens brought to San Francisco and analyzed were found to yield $8,000 in silver to the ton, while none gave less than $2,000. The vessel is provisioned for six months and loaded with tools and mining machinery. It is expected she will make the trip in about twenty-five days.

Boiler Construction and Management of Furnace Combustion.

NO. IV.

The form of grate bars demands close attention. Where is the steam user that has not been solicited in relation to "grate bars" until the subject has become as threadbare as that of lubricating oil, or lightning rods? Yet, notwithstanding this, there are some excellent grate bars in existence, of various kinds. The ordinary grate bar is too well known to need any description. In common practice the grate surface should be composed alternately of solid metal and air space, in about equal area. The grate should have depth sufficient for needed strength, and the bars so shaped that all warping by heat will be avoided as much as possible.

Feed water, for steam boilers, may be divided into two distinct classes: fresh and salt; and as salt water is more generally applied to marine boilers, the latter will not be considered. Fresh water may be either soft or hard. By soft water is meant pure water; that is, water which, upon evaporation, leaves no mineral residue which may be held in solution. It may contain impurities, such as sand, mud, etc., but these may be removed in various ways. It is the best water for boilers whenever it can be obtained. Hard water is distinguished from soft, as containing in solution salts of lime, magnesia, iron, etc., the two former being by far the most common. In some places the sulphates of lime and magnesia predominate. There are other substances that are met, such as silica, alumina, salt, etc. These impurities in the feed water often cause considerable trouble, such as the formation of scale, which sooner or later destroys the boiler unless entirely removed. There are some devices and plans for purifying, preventing, or removing all sediments and impurities in water which recommend themselves to the steam user.

Cold water pumped into hot boilers is very injurious from sudden contraction, the water impinging against the highly heated plates, which sooner or later will occasion a leak around the rivet-holes. The advantage to be gained by heating feed-water to as high a temperature as possible, before allowing it to enter the boiler, is so apparent that it need not be enlarged upon. The coil heater has been in use long enough to be well known by every one, and its present popularity attests the amount of its efficiency. There are several patent feed-water heaters and purifiers that are doing excellent duty for the purpose intended.

Special attention should be given at all times to the feed and safety apparatus; the pumps should be in good working order; they should be kept well packed and the valves in good condition. The common plunger pump, operated by belt, or attached to engine, has for a long while been doing duty in feeding boilers, and it is freely acknowledged by all competent engineers that when the machinery is in motion, and this style of pump is in operation, it is the most economical of its kind. The pump was for a considerable time the only independent boiler feeder, until the injector was introduced, being from the first considered as an ingenious and useful device for supplying boilers with water under varying pressure of steam. Whatever device may be selected for feeding boilers, it should be arranged in matters of detail so as to permit a constant feed into the boiler, which shall exactly equal the evaporation; but this should not be the limit of its capacity.

The priming or foaming of boilers has been a problem that every engineer has been trying to solve for a long time and at the present time the difficulty has, in a measure, been overcome; but still there are occasional cases where considerable trouble is experienced in this regard, but generally speaking, if the proper precautions are taken when the boiler is being built, and the right quality of feed water is used, there need be no occasion for any annoyance of this nature. In making small vertical boilers the great tendency has been to place an excessive number of tubes in the boiler, which retards the circulation over the crown sheet, and causes priming. Priming may be induced through other causes, such as sudden reductions in pressure, etc. Whatever may be the cause, it is a troublesome and dangerous occurrence, and one which needs to be overcome at any cost. There are boilers now manufactured in the market that overcome all these difficulties.

[TO BE CONTINUED.

REVIEWS.

Popular Scientific Lectures. By Prof. H. HELMHOLTZ. (Humboldt Library No. 24). NEW YORK: J. Fitzgerald & Co. CLEVELAND: Cobb, Andrews & Co.

To the series of popular expositions of science which constitutes Humboldt's Library, these lectures are a valuable contribution. The author, who is a Professor of Physics in the University of Berlin, treats in his first lecture, in a very able and graphic manner, of the relations of optics to painting, the portion relating to harmony of color being especially interesting. The second lecture is on the origin of the planetary system, with ample illustrations of the dimly perceived nebulæ of the heavens. The third lecture is entitled "Thought in Medicine," and shows the valuelessness ot mere hypotheses as contrasted by the facts brought to light by actual investigations. The numbers of the Humboldt Library are issued at an almost nominal price.

Demorest's Monthly Magazine for August. NEW YORK: 17 East 14th street.

This number opens with two superb steel engravings, one of "The Gleaner" the other of the "Marine Boat," a graphic view from shore of a gathering storm. A story of "A Bitter Lesson" is narrated by the accomplished writer Ella Wheeler. "Discord" by Hattie Whitney, is a very effective novelette. An absorbing story entitled "Kith and Kin" by Jessie Fothergill is continued. The celebrated watering place Wilhelmshohe, its castle and park, is described and illustrated. There are besides a series of excellent stories, sketches, &c., making lively summer reading, with illustrations including charming pastoral scenes. All that is most likely to interest ladies in current topics is dealt with briefly and piquantly. The "Gardens of the Sea" is a charming contribution by James Grant. Household topics are treated and valuable receipts given. There is a wealth of contributions to "coming fashions." The supplement consists of a cut pattern.

Ornamentation of Iron and Steel Surfaces.

On passing superheated steam over masses of red hot iron, the iron becomes less and less active, until it ceases to decompose at all, and on cooling is found to be coated with a kind of enamel. By admitting a few feet of cubic air to a closed retort muffle or chamber in which is cast iron, this iron takes up the oxygen of the air and a coating of magnetic oxide is formed, which increases in thickness by every successive operation. This is too costly a process for actual use. The new process is by an internal application of heat coating the iron at the same time by oxidizing and deoxidizing operations. A fire-brick chamber of any suitable dimensions is formed, in which the articles to be coated are placed, and connected with which is a set of gas-producers. The gas, as produced, is led along passages, and is there mixed with air in a highly heated condition and consumed. The product of combustion—carbonic acid—and a small quantity of free air, enter the chamber, and when partially denuded of oxygen by their contact with the heated articles. They then pass over a fire-clay regenerator, which heats the air both for the purpose of combustion and also for oxidising. This magnetic oxide coating process protects from rust, but the coating is of such a beautiful color as to render articles ready for the market directly they are out of the furnace and cooled. One remarkable feature of it is, that there is no more cost (except in the labor of handling them) in treating 2.240 articles, each weighing a pound, than there is in coating a cube of metal weighing a ton; and so penetrating is the process, that no matter how intricate the pattern may be, every crevice, which it would be almost impossible to get at with a paint brush, is as effectively coated as the plainest surfaces. For art purposes the French-grey color with shades approaching to black might not always be suitable, but if it should be necessary to use paint on the iron so coated, there is the absolute certainty that it will remain on in the same way as it does on wood or stone, and thus iron may be used for constructive work in a thousand directions in which it has not up to the present time been possible on account of its liability to rust, no matter what the coating used to protect it has been.

SCIENCE AND INVENTION.

A MINE REFUGE.—An invention of Mr. Thomas Harrison, of Sedberg, Yorkshire, is intended for saving the lives of men in mines in case of explosions, fire or floods, and consists in making refuge rooms of boiler plate or other material, these rooms being provided with air pumps, one pump to supply the room with air through a tube laid under the floor of the mine.

NEW WRITING INSTRUMENT.—Newton, Wilson & Co., the well known sewing machine men, have introduced a new writing instrument designated the "Wilson Stylus." This pencil-like pen carries a supply of ink sufficient for a week's ordinary writing, is automatic, and is always ready for work. Unlike similar contrivances, it needs no special ink, has no complicated parts, and is easy of management. They are made in several sizes, and in metal and vulcanite.

SENSITIVENESS OF THE EYE TO COLOR.—A paper by M. de Grandimont on an experimental process for determining the sensibility of the retina to colored luminous impressions was read before the Academy of Sciences, Paris. The instrument employed is called a chromatroposcope. The observer looks steadily at the central point of a disk having apertures. At a little distance from the other end of the disk colored surfaces are placed. Gradually the sensation of color is lost. If then white surfaces are quickly substituted for the colored ones, the complementary colors come out with great brightness and purity.

GAS FOR HEATING PURPOSES.—Dr. Siemens proposes that, instead of heating the retorts by means of coke in ordinary furnaces, the raw material left in the retorts after the gas has been expelled be subjected to the influence of volumes of steam. The steam, being decomposed by the latent heat of the material, passes as gas of enormous calorific power around the retorts, and so acts as an active means for the distillation of gas for illuminating purposes.

WHILE working the lead mines in the province of Segovia, some seventy miles west of Madrid, Spain, an immense cavern was found, containing, upon an argillaceous deposit and in the midst of stalagmites, five hundred skeletons of men and women. Besides ten well shaped and perfect skulls of a prehistoric type, there were chipped stone and quartz implements and fragments of rude pottery.

HOW TRAINS ARE PROPELLED BY ELECTRICITY.—As applied to the Berlin railway the initial machine is located a short distance from the line and is operated by a ten-horse power engine. The current generated is conveyed by underground cable to one of the rails of the road. From this rail it passes through the wheels of the car reposing thereon to a second machine attached to the under side of the car. The armature of this machine is caused to revolve as explained above and the current passes thence through the opposite wheels to the opposite rail and returns thus to the primary machine. The current cannot pass from one set of wheels to the other without passing through the machine, as the wheels are insulated at their hubs. The connection with the machine is effected by means of wire brushes pressing against the wheels, The armature in revolving rotates a shaft which is parallel with the car axles. Upon this shaft and upon the axles are grooved drums, around which passes a belt made of spiral steel wire. The current can be broken and reversed at pleasure by the engineer of the motor, and ordinary brakes are attached.

MARKETS.

FINANCIAL.

Office of the TRADE REVIEW.

FRIDAY EVENING, July 15.

Owing to the prevailing activity in industrial enterprises, the business in monetary circles is large. The money market continues easy with moderate applications for discount, which are met by the banks at 7@8 per cent.

NEW YORK.--On the Stock Exchange prices are weak, the trunk lines taking the lead. The elevated railroad shares were specially erratic, and Manhattan was notably weak. The new scheme for preserving the $30,000,000 (almost) of "water,' which the entire system contains has not been developed, and until it is, outsiders' trade in the stocks with the odds against them.

IRON.

Prices of pig iron are extremely firm. Unprecedentedly large sales have been effected in pig iron The large amount of iron in England ready to be shipped as soon as the markets here are favorable, alone tends to keep down prices. For Scotch pig we quote: Coltness, $23 to $23.50; Glengarnock dock, $21.50, yard, $22; Gartsherrie yard or dock, $23; Summerlee, $23 to $23.50; Carnbro, $21.50 to $23; Eglington dock, $20.50, yard $21. The advance on Bessemer abroad has had a reactive influence on prices here. The short production incident to the heated term has a stimulating effect on sales of iron. Structural plates are firm and active. Sheet mills are several months ahead of orders. Wrought pipe is active and firm at quoted discounts. In iron rails a large business has been done, exceeding that of last week, when some $70,000 of Ohio rails were disposed of.

CINCINNATI.-(Reported by Rogers, Brown &Co.) The business in foundry grades has held up well during the week and numerous inquiries make the outlook for the month encouraging. Forge irons are in no demand and will remain flat as long as the strike in this section continues. The inquiry for car wheel pig iron is mainly for future delivery. Prices remain the same as last week.

CINCINNATI.--(Reported by E. L. Harper & Co.)--Nothing new to report in the market since our last report. We quote as follows: Foundry Irons--No. 1 Hanging Rock Charcoal, $26.00@$28.00; Strong Neutral Coke, $24.50@$25.00; American Scotch. $21.50@$22.50. Grey Forge--Neutral Coke, $21.00@$22.50; Cold Short, $20.00@-21,00. Car Wheel and Malleable--Hanging Rock Cold Blast, $37.50@$40.00; Hanging Rock Warm Blast, $30.00@$32.00; Southern Car Wheel, $33.00--@$37; Lake Superior, No. 1 and 2. $33.00@$35.00; Lake Superior, No. 3 and 6, $35.00@$37.

LEAD.

For special descriptions higher prices have been paid Holders ask 4¾ cents. Corroding is quoted at 4⅞ to 5 cents. The N. Y. Mining Record states: The mining companies have at last succeeded in forming a pool among consumers and we learn that from ten to twenty millions of pounds have been contracted for delivery to extend from now until December 31st next, at 16 cents. The sale is generally thought to be a good one for the companies, but it will not probably exhaust much more than has already been mined so that at the close of the year, the bulk of the output for the next six months will be in hand.

COPPER.

Sales are reported of 18,000,000 lbs. of copper to manufacturers for delivery through the balance of the year at 16@16¼ cents. Bolt copper, heavy and light, is being offered at lower figures. Yellow metal is at 16 cents, with buyers by no means eager to purchase, awaiting further developments.

TIN.

Business moderate and confined to jobbing lots. Straits and Australian are held at 20⅝@30½c.; Billiton, 21c. There appears some doubt whether the producing countries will be able and willing to supply requirements for the next six months without a further advance in prices.

COAL.

The rates quoted by companies are by no means firm. There is a good demand for manufacturing purposes, and shipments continue active. The N. Y. Mining Record observes: The competition among bituminous producers is so great as to give that coal a decided advantage in many markets, even with the present prices of manufacturing sizes of anthracite coal.

HARDWARE.

There has been a fair inquiry for general assortments. The demand for tools is active. Quotations for cut nails are somewhat irregular. Blind hinges have been advanced by makers, and are now 70 and 10 per cent discount. Dealers say that there will soon be an advance on various descriptions of hardware. The American Screw Company of Providence, Rhode Island, announce that their special discounts on wood screws, for the season ending December 31st, 1881, will be for purchases amounting to $250 net, extra 2½ dis., for purchases amounting to $500 net, extra 5 dis.; to be credited at the end of the season, or after the amounts shall have been purchased. The arrangement made whereby all file manufacturers in the country will use uniform sizes of steel, is thoroughly welcomed by the jobbing trade. Some time, however, must necessarily elapse before it comes into effect. Circulars quoting uniform discount for screws have come to hand.

LUMBER.

Trade at the yards is brisk. Actual selling prices are fully held up to the quoted lists, and the feeling of lumbermen is that lumber is worth more than these figures. Most sizes of dimension stuff and long lumber are scarce. The better qualities command somewhat advanced rates. Larger transactions than in any previous year are anticipated. Inch lumber is steady. Shingles tend to advance. Lumber freights are somewhat easier.

WOOL.

The market is active. Ohio holders are demanding as much as 40c. which disposes operators to be cautious in their purchases. The stocks of Eastern brokers are poorly assorted, especially in the way of fleeces, but they are inclined to resist the views of growers and interior operators.

LUMBER.

PLANK.

2 INCH--MIXED WIDTHS.

A 1&2, $45, A3, $35, B. $28, C. $18, D. $14, E. $12.

1¼ AND 1½ INCH.

A 1&2, $44, A3, $35, B. $28, C. 18. D $14. E $12.

BOARDS.

1 INCH MIXED WIDTHS.

A 1&2, $42, A3, $32, B. $24, C. $16. D. $14, E. $12.

STOCK BOARDS.

12 INCHES WIDE.

A 1&2, $43, A3, $34, B. $26, C. $17, D. $15, E. $13.

STRIPS.

6 INCHES.

A 1&2, $40, A3 $33, B. $28, C. $18, D. $14, E. $12.

WORKED LUMBER

Flooring.
A3, $35, B. $30, C. $20.

Norway Flooring.
A3, $28; B $22; C $18.

Matched Drop Siding, 6 in.
A3, $36, B, $30, C, $20

Beaded Ceiling $2 higher than flooring

One half inch Bevel Siding.
A 1&2, $22, A3 $20, B $18

Ash Flooring, A1&2 $35.

BILL STUFF.

Small, 18 feet and under, $14.
20 feet and over, $5 less than length.

SHINGLES, LATH AND MILL WORK

Shingles XXX 18 inches,	$3.75
Shingles Clear Butts	2.75
Lath	2 50
Surfacing one side $1.50; 2 sides	$2.00
Making, Flooring and Drop Sidings,	2.50

HARDWOODS.

OAK.—1st and 2d clear, 1 to 4 inch	$35 00
3d	30 00
1st common	25 00
2d common	28 00
BLACK WALNUT—Clear counter tops, 20-inch and up	150 00
1st and 2d inch	75 00
1st and 2d plank	80 00
Common	55 00
Select, ⅝x10 inch and over	68 00
ASH--1 to 2 inch, $35, over 2 inch	38 00
Wagon stock	40 00
HICKORY wagon stock 1 to 4 inch	50 00
MAPLE--Clear, 1 to 4 inch	35 00
BUTTERNUT--1st and 2d clear, 1-inch	55 00
CHERRY--1st and 2d clear, 1-inch	60 00
WHITEWOOD--Clear selected, w'd 1 to 4 in	400 0
1st and 2d clear, 1 to 4 inch	35 00
Selected	30 00

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"Independent Lock Lever" Hay and Grain Rake.

Patented August, 1867, January, 1875, June, 1875, and November, 1876. 60,000 now in use. Light touch of lever and driver's weight dumps it. Best self-dump in market. Twenty steel teeth. No complicated rachet wheels, friction bands or other horse machinery needed to operate it. A small boy rakes easily twenty acres per day with the Coates' Lock Lever. Send for circulars.

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OHIO PRESERVING CO.

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GASOLINE COOK STOVE

It is straight, with but one valve and has been tested for four years, giving entire satisfaction. The gas jet is thrown direct to the top of the combustion cap, producing a steady blue flame, absolutely odorless, which cannot be done with any side valve burner. There is no packing used in this Stove. Agents wanted. Send for Circular and Price List. Address

American Vapor Stove Co.

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Is the best place to go to obtain thorough instructions in Bookkeeping, Rapid Business Arithmetic, Penmanship, Shorthand Writing, Business Correspondence, Commercial Law, Grammar, Composition, etc. Those wishing to obtain a practical education in the shortest time, at the least possible expense, should not fail to attend the Forest City Business College, 9 Public Square. Call at College office or address

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Furnished both Dry and Ground in Oil.

Used by nearly all the Railroads.

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HARDWARE.

Adzes.

Carpenter's.....per doz $16 80
Ship..... " " 18 75
Heavy railroad.... " " 19 50

Anvils.

Wright's.....per lb.....10¾
Eagle..... " 9½

Animal Pokes.

Berea, per doz..... 4 00
Eagle, per doz..... 5 00

Apple Parers.

Domestic & Reading ℔ doz $7 50
Turn Table..... .00

American Stamped Elbows
Genuine Russia Iron

4	inch	per doz	4 50
4½	do	do	5 50
5	do	do	7 50
5½	do	do	8 50
6	do	do	9 50
7	do	do	11 00

Planished American Russia Iron

4	inch,	per doz	4 00
4½	do	do	5 00
5	do	do	6 50
5½	do	do	7 50
6	do	do	8 50
7	do	do	9 50

Charcoal Iron

4	inch,	per doz	2 00
¼	do	do	2 50
5	do	do	3 50
5½	do	do	4 00
6	do	do	4 50
7	do	do	5 50

25 per cent

Augurs and Bits. Dis

C S cut augurs.....40@10
do do do bits.....40@10
D C gimlet do....$6.00 Gross
Snells.....@40
Russell Jennings'.....10 10@10
Cook's pat augur.....40@10@50
Post hole, net ℔ doz.....$21@24

Balances. Dis

Chatillon's, Frary's, Morton's 15 & 10 per ct

Bellows. Dis

Blacksmith's com new list, 40 ℔ ct
Moulder's new list, dis 40 ℔ cent
Hand, new list, 40 per cent

Bolts. Dis

Carriage and tire, com 80@80 @5
do do Norway.. 70@
Stove.....@40
Plow.....@40
Wagon.....@40
Machine & Square head 60@10

Butts. Dis

Wrought brass..... 75@5
Cast, loose joint and loose pin..... 55&10
Wrought, fast joint narrow..... 50&10
Wrought fast joint broad..... 55&10
Wrough loose joint broad..... 55@10
Wrought table and back flaps..... 50@10
Loose pin, reversible 55@10
Brass kettles—per lb 32 @35

Chains.

Coil by cask.....
3-16 | ¼ | 5-16 | ⅜ | 7-16 | ½
9½ | 7½ | 7 | 6¾ | 6 | 5 6

Crucibles.

Per number 4@6 4½

Clothes Wringers

Keystone per doz.....2@45
Novelty per doz..... 45@60

Chisels.

Hot and cold cutting ℔ lb..... $ 30
Railroad track..... 30
Machinists..... 30
Chipping, mallet head..... 50
Cape..... 50
Packing..... 50
Stone cutters..... 50

Crowbars.

Steel point..... ℔ lb $ 5
Solid steel..... 8

Drawing Knives.

Discount.
Witherby's.....60@10 ℔ cent
Barton's.....15
Adjustable handle....10

Emery.

Genuine Chester..... 7@ 8
Wellington..... 10@12

Files.

Rothery 30 per cent
Disston..... 40@45

Hammers.

Mason's stone hammers, steel faced and pene..... ℔ lb 15
Mason's stone hammers, solid cast steel..... 25
B. S. Napping hammers 30
Striking hammers, solid cast steel, 5 to 25 lb..... 20
Drilling hammers, solid cast steel, 3 to 6 lb..... 20
Turning hammers, full polished.....each 2 00
Set hammers..... ℔ lb. 35
Creasing hammers..... 35
Ordinary bush hammers 55

Hinges.

Champion double acting spring hinges.....dis. 30
Hook and Eye hinges ¼ to 1 in. 6½c; ⅝ in. 7½c; net ¼ in. 10c
Strap and T, new list dis 50, 10
Screw Hook and Strap 8, 10 @10 and 12 in. net 4½c
Clark's Gate hinges No. 1 & 2, dis 50o. and 10
Shepard's Gate hinges, Nos, 10, 20 and 25, dis 30

Horse Rasps.

Heller's.....dis per cent 20
"Arcade"... 50 & 20

Harrow Teeth.

Iron ⅝ to 1 inch.....per lb 2¾c
Steel, square..... 4½c

Nails.

BRADS AND FENCE.

10 to 60d	$2 90
8 and 9d advance	25
6 and 7d.....do	50
4 and 5d	75
3d	1 50
2d	2 75
3d fine	3 00
2d fine	3 75
⅛ inch lining	4 50
4d barrel	1 00
1¼ inch barrel nails	1 50
1½ do do do	1 75
1 do do do	2 50
⅞ do do do	3 00
Cut spikes, all sizes	25
Clinch nails, all sizes	1 75
Casing and box nails 75 cts advance	
Finishing nails, $1 25 do	
Tobacco nails, 50 cts do	

Nuts and Washers

	Dis
Nuts	7¼
Washers	7

Rivets. (See list) Dis

Iron, in paper	50
Iron, in bulk	30
Copper	33⅓ per cent

Picks.

Railroad, 4 to 5 lbs	doz	$7 75
5 to 6 lbs		7 75
6 to 7 lbs		8 50
7 to 8 lbs		9 50
Railroad Tamping Pick 7 to 8 lbs	doz	13 50
Mill Picks per lb		75c

Squares. Dis

Steel or iron, case lots.....50
Try squares and T bevels.....40

Spikes—WROUGHT

All lengths by ¼ inch 4½c
do do do 5-16 .....3½
do do do ⅜, 7-16 & ½ in 3¼

Shovels and Spades.

Ames' new list, Jan. 26, 1881, ... dis 15
Hussey, Binns & Co. patent .....dis 15
Old Colony .....dis 12½
Remington's (Lowman's Patent).....dis 25
Rowland's .....dis 40
Griffiths ..... dis 40&10

Shovels and Tongs.

Iron and Brass Head, R. & E. list .....dis 50&10&2
Polished Steel, new list dis 50&10&2

Sad Irons.

From 4 to 10 lbs....per lb 3½ net
Self-Heating.....℔ doz $9 net
" Tailors..℔ doz $18 net
Gleason's Shield and Toilet .....dis 25
Mrs. Pott's Irons, double pointed.....dis 35
Mrs. Pott's Irons, square back .....dis 40
Enterprise Star Irons .....dis 40
Combined Fluter and Sad Iron.....℔ doz $15, dis 15

Saw Sets.

Barnet's Improved X Cut, per doz $12; Hand Saw, per doz $ .....dis 20
Stillman's Gem, per doz .....dis 30
Stillman's Imitation, per doz .....&10
Common Lever, per doz .....
Leach's No. 0 $8; No. 1 $ .....dis 25
Hammer, Hatchet $ 50 dis 10
" Bemis & Call Co.'s new patent .....dis 10 & 5
Bemis & Call Co.'s Lever and Spring Hammer .....dis 30 &
Bemis & Call Co.'s Plate .dis 10
" " Cross-cut dis 12½
Aiken's Genuine $13, dis 50&10
" Imitation $4, dis 30
Hart's Patent Lever .....dis 20
Disston's .....dis 20

Scales. Dis

Fairbanks' 25

Screws. Dis

Flat head iron or steel per cent dis..... 40
Flat head brass..... 40
Round head iron or steel..... 35
Round head brass..... 30
Coach or lag .....60@10 ℔ ct

Wire.

Brass and Copper.....dis 20
Bright & annealed, Nos. 0 @ 18 dis 55
" " Nos. 19 @ 20 dis 60
" " Nos. 27 @ 36 dis 65
Coppered.....Nos. 0 @ 18, dis 50
Galvanized, Nos. 0 @ 6, ℔ lb 10c.....dis 40
Galvanized, Nos. 7 @ 18, market list,.....dis 45
Tinned, Nos. 0 @ 18,.....dis 45
Cast steel.....dis 30
Tinned Broom Wire, Nos. 18 @ 25.....dis 50
Annealed Fence, Nos. 8 and 9.....dis 55
Annealed Grape, Nos. 10 to 14.....dis 55
Galvanized Telegraph, Nos. 7 to 9 ..... ℔ lb 9c
Galvanized Telegraph, Nos. 10 and 11 ..... ℔ lb 10c
Galvanized Telegraph, No. 12 ..... ℔ lb 10½c
Fence staples.... ℔ lb 7½@7¾c
Fence Staples, galvanized, ℔ lb 8½@8¾c
Stubs Steel Wire... $7 00 to £

Tank Iron.

8-16, ¼ and ⅝ inch thick.... 3 20

Tacks. Dis

Black	30—10
Tin'd	55—10

Traps. Dis

New House	80
Peck, Stow & Co.....	50—10

Vises.

olid box, Dis 40

Wrenches.

Coe's genuine.....50
Coe's Imitation 60 per cent

Bag Holders.

Sprengle's Pat, $18.00 per doz 40 per cent. dis.

Gas and Steam Fitters' and Machinists' Supplies.

Gas and Steam Pipe—See Pipe Wrought.
Enameled Pipe .....dis 65
Artesian Well Casing....net list
Hydraulic Tubes.....net list
Malleable Iron Fittings..net list
Cast Iron Fittings .....dis. 55
Globe Valves.....dis. 50
Angle Valves.....dis. 45
Check Valves.....dis. 45
Safety Valves.....dis. 45
Eddy Gate Valves.....dis. 20
Steam Cocks.....dis. 45
Service Cocks.....dis. 45
Ball Gauge Cocks (net per dozen).....$15
Compression Gauge Cocks dis. 45
Miss. Gauge Cocks.....dis. 45
Register Gauge Cocks (net per dozen).....$15
Cylinder Cocks.....dis. 45
Air Cocks (net per dozen)..$2 75
Oil Cups.....dis. 45
Steam Gauges.....dis. 35
Water Gauges.....dis. 45
Scotch Glass Tubes.....dis. 60
Steam Whistles.....dis. 45
Iron Body Globe Valves..dis. 55
Iron Body Safety Valves..dis. 55
Iron Body Steam Cocks..dis 55
Pipe Tools.....special
Globe, Angle and Check Valves (Powell's regrinding).....dis. 45
Guarantee "Jet Pumps" dis 40
Mack's Injectors.....dis. 25

Boiler Plates.

("Gaylord"—Standard Quality.)

C. No. 1	4 50
C. H. No. 1 Shell	4 60
C. H. No. 1, 50,000	5 00
C. H. No. 1, 55,000	5 50
C. H. No. 1 Flange	6 00
Firebox	
T. S., 60,000 .....(as per)	6 00
T. S., 65,000 .....(act of)	8 00

Homo. Steel, 70,000 (of Cong) Heads, ¼c ℔ lb. extra.

N.B.—Eastern brands of boiler plate at from 2-10 to 3-10c ℔ lb less than above prices.

Boiler Rivets—"Albany."

⅛, ¼, 11-16, and ⅜ in. diam .5 50

Sheet and Tank Rivets.
"Norway."

All sizes.....dis. 15

Nuts, Bolts, etc.

Square and Hex. Nuts ....dis 7
Washers .....dis 7
Machine Bolts .....dis 60
Bolt ends.....dis 60
Boiler Patch Bolts.....net list

Boiler Tubes.

"National" Standard Gauge 1 inch to 10 inch.....dis 40
"National" Standard Gauge 11 inch to 15 inch.....dis 25
" " Special Locomotive.....net list

Boiler Makers' Tools.

Duty" Punch Shears.....net list
" Hand Lever Shears.....net list
" Power Punch.....net list
" Hand Punch.....net list
Steel Screw Punch.....net list
Iron Screw Punch.....net list
Boiler Plate Rolls.....net list
Buffalo Forges & Blowers dis 20
Watson's " " net list
Spring Tube Expander ...dis 15
Roller Tube Expander ..net list
National Tube Cleaner ...dis 20
Wire Flue Brushes.....net list
Anvils—"Peter Wright" 12½ ℔ lb
Solid Box Vises.....net list
"St. Louis" Bellows.....dis 20

Tinners' Tools & Machines.

Machines (P. S. & W.) list add 20
Tools (P. S. & W.) .....add 6

IRON AND STEEL.

Flat Bar.

1½ to 4 by ⅜ to 1 inch	2 25
4¼ to 6 by ⅜ to 1 inch	2 35
1¾ to 6 by 1¼ to 1½ inch	2 65
1¼ & 1½ by ⅜ to ⅝	2 35
1 & 1¼ by ⅜ to ⅝	2 45
⅝ & ¾ and ⅞ by ⅜ to ⅝	2 65

Rounds and Squares.

1 to 1⅞	2 25
2 to 2⅝	2 45
2¾ to 3¼	2 75
3¾ to 4	3 25
¾ to ⅞	2 35
⅝ to 9-16	2 45
½ to 7-16	2 65
⅞	2 85
5-16	3 05
¼	3 25
3-16	5 25

Heavy Band.

1½ to 6 by ¼ and 5-16 inch.	2 45
1 to 1¾ by ¼ and 5-16 do	55
⅞ to ⅝ by ¼ and 5-16 do	2 75
⅝ to ½ by ¼ and 5-16 do	3 25

Half Oval and Half Round.

Wagon box iron ⅜ and ½.. 3 75
1-10c per lb extra will be charged for cutting to specified lengths

Light Band.

1½ to 2¾ by ⅛ to 3-16..... 2 75

Hoops.

1¼ to 2 , Nos 18 to 18..... 3 35
2¼ to 3½ do 13 to 15..... 3 25
1-10 extra for each gauge lighter

Sheet Iron.

No 22 to 24	4 00
No 25 to 26	4 20
No 27	4 40
No 28	4 80

American Steel.

Best tool steel	14½c
Machinery steel	9
Double shear steel	21@2

Bessemer Steel Tire.

⅜ to 1 by 3-32	4½ ℔ lb
⅜ to 1 by ⅛ to 5-32	4½ ℔ lb
⅜ to 1 by 3-16 to ¼	4½ ℔ lb

SCRAP IRON AND OLD METAL

DEALER'S SELLING PRICES.

	Net Tons.
No. 1 wrought scrap	$27@24
Sheet and hoop "	19@18
Cast scrap, (No. 1 heavy).	19@21
Cast Scrap (Stove Plate).	12@18

OLD METALS.

Old copper per lb	17c
No. 1 H. Brass per lb	16
Heavy yellow Brass do	13
Light Brass per lb	10
Scrap Zinc per lb	@3¾c
Tea Lead per lb	@3¾
Heavy Lead per lb	4 @4¼

PIPE, WROUGHT.

Gas and Water.

Size, Inside Diam	Price Per Foot Black	Price Per Foot Galvan	Price Per Foot Enamel	Weight Per Foot
⅛..	08			24
¼..	08	11	11	42
⅜..	09	12	12	56
½..	11	15	15	85
¾..	13½	19	19	1 12
1 ..	19	28	28	1 67
1¼..	27	40	40	2 25
1½..	33	47	47	2 69
2 ..	46	64	64	3 66
2½..	75	1 00	1 00	5 77
3 ..	95	1 30	1 30	7 54
3½..	1 25	1 70	1 70	9 05
4 ..	1 50	2 05	2 05	10 72
4½..	1 75	2 40	2 40	12 49
5 ..	2 25	3 00	3 00	14 56
6 ..	2 75	4 00	4 00	18 77
7 ..	3 75	...	...	23 45
8 ..	4 75	...	...	28 35
9 ..	6 50	...	...	34 07
10 ..	8 00	...	...	40 64
12 ..	12 00	...	...	...

Above 12 in. special rates; discount 65 per cent.. Markets are firm.

TINNER'S STOCK.

Tin.

10x14 IC	charcoal	6 75
do	IX	8 75
12x12 IC	do	6 75
do	IX do	8 75
14x20 IC	do	6 75
do	IX do	8 75
do	IXX do	10 75
do	IXXX do	12 75
do	IXXXX do	14 75
DC, 100 plate, charcoal		12½x17 6 75
DX	do	12½x17 do ... 8 75
DXX	do	12½x17 do ... 10 75
DXXX	do	12½x17 do ... 12 75
DXXXX	do	12½x17 do ... 14 75
14x20, IC roofing	do	do ... 6 25
do	IX do	do ... 8 25
20x28, IC	do	do ... 13 00
do	IX do	do ... 17 00
Pig tin		
Pig tin banca		
Bar tin		

Copper.

Tinned	
Copper bottoms	
Alloy sheets	
Braziers copper	
Planished copper sheathing size	
Boiler sizes do	

Zinc.

Sheet by the cask	
Sheet less than cask	

Sheet Iron.

Galvanized, No 17 to 20	
do	do 22 to 24
do	do 25 to 26
do	do 27
do	do 28
	45 dis.
Russia Iron by bundle	

Pat Planished Sheet fr

[A]				
[B]				
Nos	10 to 14	15 to 20	21 to 24	25 to 26
Com	3-60	3-80	4-00	4-20
Char	5-60	5-60	6-00	6-20

Sheets over 28 in. wide ½c extr

GLASS.

(Per box of 50 feet)

SINGLE STRENGTH

6x8 to 10x15	7 50
11x14 to 15x24	8 50
16x24 to 20x28	9 75
15x34 to 24x30	10 75
26x28 to 24x36	11 50
26x36 to 26x44	13 25
26x46 to 30x50	14 00

DOUBLE STRENGTH

6x8 to 10x15	11 75
11x14 to 15x24	13 25
16x24 to 20x28	15 75
15x34 to 24x30	17 25
26x28 to 24x36	18 50
26x36 to 26x44	21 25
30x50	22 50
30x52 to 30x54	23 25
30x56 to 34x56	25 00
34x58 to 34x60	27 75
36x60 to 40x60	30 00

Dis 60 & 10 single, 60 & 20 double

OILS & AXLE GREASE

Pure Oils. packages included

Sperm, winter bleached per gal	1 80@1 40
Elephant, winter bleached, per gal	80@ 85
Whale, winter bleached per gal	80@ 85
Seal, winter bleached	60@ 65
Bank oil	80@ 85
Straits	48 @ 51
"A" oil for tanner's use	50 @ 53
Lard oil extra winter	85 @ 40
do No 1 do	65 @ 68
do No 2 do	52@ 55
Tallow oil	60 @ 65
Neat's foot oil pure	80 @ 83
do No 1	65 @ 70
Linseed oil, raw	59 @ 62
Linseed oil boiled	62 @ 65
Cotton seed oil white	63 @ 66
do do yellow	60 @ 63
Resin oil, first run	25@ 30
Naphtha deodorized	15@ 20
Carbon oil Ohio legal trst	9½@11½
West Virginia lubricating 28 deg	22@ 30
Pure Mecca	55@ 50
Paraffine oil winter pressed grav 25	
do do do	25@ 30
Paragon lubricator	@1 00

Compound Oils, (light color'd)

No 1 Sperm signal oil	65@ 68
No 2 do do	58@ 63
No 1 wool and spindle oil	40@ 50
Golden machinery oil	30@ 35
No 2 Mecca (dark colored)	20@ 30
Axle Grease (light colored per gross	7 50@ 8 00
do in kegs and barrels per lb	04@ 05
Tallow, prime	5½@
Tallow, dark and No. 2	@ 4½
Beeswax	20@

PAINTS.

Drop black, Eng ℔ lb	18	@30
do do Am. do	12	@15
Black lead do	6	@12
Lamp black Eddy's refined per lb	27	@31
Lamp black, Germantown, per lb	10	@12
Lamp black ordinary per lb	6	@ 8
Chinese blue ℔ lb	75	@80
Prussian do do	45	@60
Ultramarine blue do	18	@40
Clestial blue do	8	@10
Paris green do	25	@30
Chrome green do	8	@14
Fr Crown green do	16	@18
Eng Vermillion do	70	@80
Am Vermilion do	15	@18
Indian red Eng do	11	@14
Venetian red, Eng do	1½	@ 2½
Orange mineral do	10	@14
Rose pink best Eng do	12	@15
Red lead, Eng do	8½	@ 9½
Carmine No 40 ℔ oz	30	@75
Umber ℔ lb	5	@10
Sienna do	5	@15
Vandyke brown do	8	@10
Spanish brown do	1¾	@ 2½
Chrome yellow do	06	@12
French Ochre do	2	@ 4
Am Ochre do	1½	@ 2
Iron clad paint do	1½	@ 2½

Colors in Oil.

Drop Black ℔ lb	12	@24
Black do	8	@12
do	20	@45
do	8	@12
do	8	@15
do	8	@15
do	8	@16
do	8	@16
do	8	@16
do	15	@35
do	8	@13
do	10	@18
do	7	@12
do	12	@24
do	7	@12
n		
do	16	@18
do	18	@
do	4½	@ 5

Varnishes.

ishing	@6 00
ly	@5 00
	@4 00
	2 60@3 00
	1 50@2 00
Japan	2 00@
turpen-	
	95@1 10
s' coach	
	6 25@
extra	1 40@1 75
	1 00@1 50
(parlor	
	2 00@2 25
sh (shellac)	
	4 00@4 25
dium self-	
	1 00@1 50

Leads in Oil.

Williams &		
ly pure ℔ lb		7@7½
	do	5½@ 6¼
& Co's		
ure	do	7@7½

Miscellaneous.

es in Oil		8½@ 11
surfacing		
℔ gal		@2 00
Co's china gloss ℔ lb		16 @ 18
French zinc	do	9½@ 10
Paris white	do	1¾@ 2¼
Whiting	do	1 @ 1¼
Lump chalk	do	1 1¼

CORDAGE.

Manilla cordage, ¼ in diam upward	15
Manilla cordageless	15½
Manilla lath yarn	14½
Manilla hay rope 2 and 3 ply	13½
Russia hemp tared cordage	13½
Spun yarn	13½
Russia bolt rope	13½
Houseline, Marline	18
Oakum	13½
Pine tar	10 50@ 11 00
Rosin, per bbl of 280 lbs	4 00
Canvas, awnings and tents	3 25

Hides and Leather.

Prime cured hides,	8½
Green hides	6½
Bull, scrubby, badly scored or damaged, cured, two-thirds price.	
Prime dry hides and Kip	11 @12
Prime dry flint hides and Kip	@12
Damaged dry hides and Kip, two-thirds price.	
Horse hides, green No. 1	$ @2 00
Horse hides, dry	2 00@2 25
Prime cured veal calf, 8@15 lbs	14
Prime dry veal calf	14
Prime dairy calf, salted (Deacon Skins)	75@
Winter Kip, same as hides	
Pelts, wool estimated as washed	25@1.25
Rough leather, prime	26 @27

GROCERIES.

Coffee.

Rio green	12	@ 17
Java "	21	@ 26
Roasted	14½	@ 16½
Ariosa		@ 16½

New Teas.

IMPERIAL.

Common	30	@ 40
Choicest	50	@ 60

YOUNG HYSON.

Common	20	@ 25
Fine	30	@ 35
Extra fine	40	@ 45
Choice	50	@ 55
Choicest	70	@ 75

GUN POWDER.

Fine	25	@ 25
Extra fine	40	@ 50
Finest	70	@ 80
Choicest	80	@ 85

OOLONG.

Common	20	@ 25
Fine	25	@ 30
Extra Fine	45	@ 50
Choice	60	@ 75
Choicest	80	@ 90

JAPAN UNCOLORED.

Fine	20	@ 25
Extra Fine	30	@ 35
Finest	40	@ 45
Choice	50	@ 60

Crushed Sugars.

Cut Loaf	11½ @ 11¾
Powdered	11 @ 11¼
granulated	10½ @
Standard A	9⅞ @ 10
Coffee extra B	9¾ @ 9¾
Coffee extra C	8¾ @ 9⅛
Scotch refined	
C Coffee	8½ @ 9
Yellow C	8 @ 8½
Molasses, refined	7¾ @ 8

Soaps.

Cleveland chemical	3¼@ 4
Bell's ⅜ lb pressed cakes	4 85@
Lautz do do	5 00@
Thompson's ⅜ do	4 75@
O K soap	8 ⅜@
Babbitt's ⅜ lb cakes	5 50@
do N Y city	4 75@
Olive Soap.	4¾@
Dobbins	9 @
Thompsons standard	7½@
Bell's ⅜ lb cake laundry	4 85@
Castile, American	9 @ 10
do foreign mottled	10 @ 11
do white	15 @ 18

Jellies.

4 oz tumbler currant	@87½
Case Jelly	@1 75
Large Goblet	@2 00

Wooden Ware

TUBS.

Extra 3 hoop oak grained, per doz	10 25
No 1, 3 do	8 50
No 2, 3 do	8 25
No 2, 2do	7 50
No 3, 2 do	6 50

PAILS.

Dairy, extra small china fin. per doz	0 00
do 3 hoop do do	3 00
Common, 2 hoop, oak, grained do	1 75
do 3 do do	2 00
Half do 2 do do	1 75
Army, iron pails, flush bottom	3 50
Horse, wire do	3 50

Wash Boards.

Globe washboards per doz	2 50
Star	1 65
Eagle	1 75
Diadem, per doz	65